

Hardy Fern Foundation NEWSLETTER

Editor Sue Olsen ■ VOLUME 7 NUMBER 4 ■ FALL 1997



President's Message

Anne Holt and Jocelyn Horder

The fall rains discouraged potential buyers at the Northwest Horticultural Society's fall sale, but not the sale of ferns at the Rhododendron Species Botanical Garden sale the preceeding week-end. The HFF profit was approximately \$800.00 and we profit as well by educating the public about the vast assortment of ferns suitable for garden use. We again thank Sue and Herman Entz for their time and effort in co-ordinating our sales booth.

Ferns are being distributed as well. After our September board meeting volunteers packed and shipped 124 ferns to members and 423 to our Satellite Gardens. Your board members also conducted an evaluation of the ferns planted in the Rhododendron Species Botanical Garden. We are happy to report that they are thriving. A full report will be published along with satellite reports next spring. Remember that your HFF membership entitles you to one free admission to the RSBG annually so be sure to stop and see your collection when you are in the area. We would like to encourage our members to evaluate their own gardens as well and send this information to our editor. We will begin publishing these reports with this issue. Thank you.

We were pleased to donate \$500.00 to Steve Hootman for his collecting trip to China and \$150.00 to Dan Hinkley for his collecting trip to Korea and Japan. We look forward to having new and different fern spores to grow when they return.

Plans are under way for the Northwest Flower Show where the HFF will again share display space with the Rhododendron Species Foundation. Board member Glen Youell has agreed to co-ordinate our efforts. She needs volunteers to help staff the booth. The show runs from Feb. 4 - 8. To volunteer call Mrs. Youell at 425 885-6387 or drop her a note at 3459 122nd Pl. N.E., Bellevue, WA 98005. In addition to helping the HFF, volunteers also receive free admission to this fantastic show.

We are in the process of compiling an e-mail directory of our membership. To be listed please send your e-mail address to Hffmembership@juno.com.

Because of the heavy rains here the slugs and snails are thriving. Do keep baiting for these hungry creatures. A spritz with a mixture of one part non sudsy ammonia to four parts water also does the trick.

Thanks

Your HFF board would like to thank the following members who have contributed above and beyond the basic membership dues.

Supporting:

Mrs. Charles Hyde
Contributing:
Kathleen Dennis
Mrs. Phil Duryee
Jocelyn Horder

Charles Lamade
Marshall Majors
Sue and Harry Olsen
Meredith Smith M.D.
Chris Spindel
Glen Youell

Endowment Fund:

Nancy Ballard
Frank Damgaard
Susan Eichhorn
Irving Knobloch
Martha Robbins

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Welcome New Members

Joe and Judy Caughlin
C. Layng
Lisa K. Ravenholt
Mrs. Wendy Hirschman
Susan M. Callan
John Henry Co.
Blanchard Reel
Linda Shaw
Joyce Wiechmann
Virginia Lusk

Exploring Private European Fern Gardens Summer 1997 - A Series

Sue Olsen, Bellevue, WA

A VISIT WITH PhDr. ZDENEK SEIBERT in TACHOV, CZECH REPUBLIC SEPT. 1997

Fern lovers who have grown ferns from spores contributed to various spore exchanges or for that matter alpine garden enthusiasts who have dipped into rock garden society seed exchanges will immediately recognize the name of frequent donor PhDr. Zdenek Seibert. This charismatic 86 year old gentleman has been donating spores and seeds to assorted exchanges for as long as I can remember. Much of his material would be new to cultivation at the time and American fern enthusiasts can thank PhDr. Seibert for such wonderful introductions as *Polystichum neolobatum*, *Dryopteris namegatae*, *Dryopteris bissetiana* and a long list of *Aspleniums* to name just a few. I've been corresponding with PhDr. Seibert for many years and have been delighted to be on the receiving end of his generosity with fern spores. I have always wanted to meet my distant penpal PhDr. Seibert and my husband and I decided that late summer 1997 would be an ideal time to visit the Czech Republic and PhDr. Seibert's garden in the city of Tachov. It was an exciting prospect for us all and turned out to be one of the highlights of our trip.

PhDr. Seibert who immediately asked to be addressed by his Christian name, Zdenek, gardens on a hillside overlooking the city. His life has spanned two world wars as well as 40 years of Communist rule all of which determined the course of his career but did not deter PhDr. Seibert's love of plants. The extent of his collection was immediately apparent upon entering the garden and I was overwhelmed especially as we were introduced to the many *Asplenium* species, and assorted subspecies and hybrids, particularly those of *A. trichomanes*. It was a tremendous learning experience and I hope that we can sort this information out in future newsletters. Part of his collection is a reflection on his long time association with the late Dr. Tadeus Reichstein, a Swiss Nobel Prize Recipient in physics, who in his later years devoted much of his time to the study of pteridology especially the

Aspleniums. Another colleague, Stefan Jessen of Chemnitz, Germany also is doing continuing research on the *Aspleniums*. Mr. Jessen has traveled and collected extensively in eastern Europe and Russia. He has shared much of this rare material with PhDr.

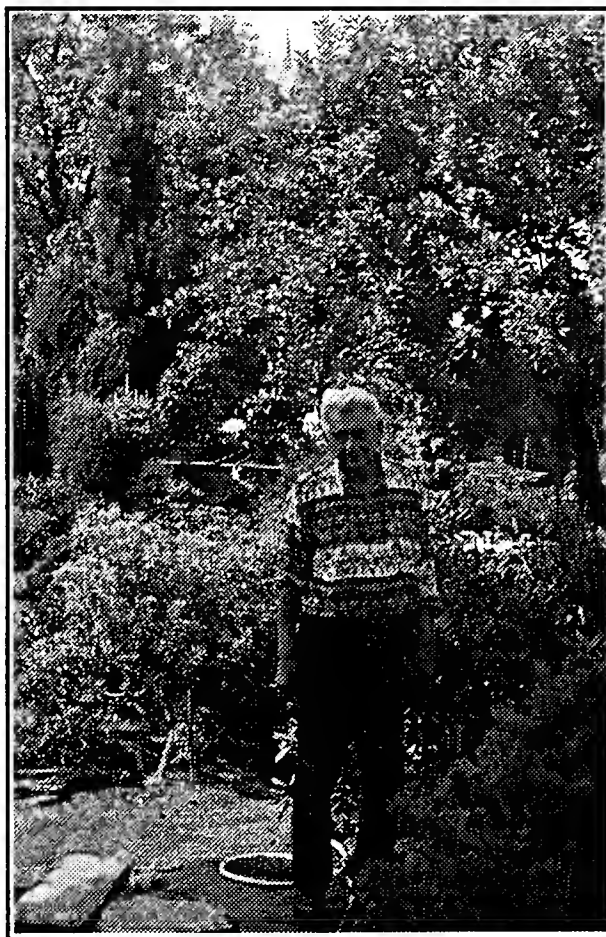
Seibert so his collection is comprehensive indeed.

Almost all of the approximately 1/3 acre garden is covered with plants many in pots. In addition to ferns and alpines PhDr. Seibert has large collections of rhododendrons, daphnes and conifers. There are also a number of structures for propagating. He sows his fern spores in a heated greenhouse. With the exception of the green spores (*Osmunda's* etc.), he sows in the fall or winter so that he can control the temperature. (Their summers are hot.) The temperature is maintained at 70°. As the young sporophytes develop they are hardened off and moved into another section of the greenhouse where the temperature never dips below 40°. Eventually they go into a lath house, a shade house, the garden and in many instances, the gardens of fellow fern lovers.

PhDr. Seibert is ably assisted by another fern enthusiast, Stanislava (Tanya) Hoskova. It was a pleasure to have her join us for our tour. Our lovely visit came to an end with Tanya serving us refreshments in the garden. By now two visiting German alpine enthusiasts had joined us. (They were as enthralled with PhDr. Seibert's alpines as we were with the ferns.) We were surrounded by a panoramic city view, beautiful plants and best of all good company.



Ferns in PhDr. Seibert's lath house. Photo by Harry Olsen.



PhDr. Seibert.

Photo by Harry Olsen.

A Reminder

Dr. Alan Smith of the University of California Berkeley will conduct a **two day workshop, January 10 & 11 on the Polypodiaceae.**

The class is limited to 20 participants on a first-come first-served basis. The charge is \$165. for non-members of the Friends of the Jepson Herbarium and \$150. for members. Registration should be sent to Friends of the Jepson Herbarium, 1001 Valley Life Sciences Building #2465, University of California, Berkeley, CA 94720-2465. For more complete information see the announcement in the summer 1997 newsletter.

PhDr. Zdenek Seibert's Biography

PhDr. Seibert writes:

"Dear Mrs. Olsen,

I feel very pleased, honoured and flattered by your asking me for a biography of my life.....If you insist on your wish to have my biography I enclose for this case some words about my life."

I was born on May 13, 1911 at Vizovice - a small Moravian town. I started my career as a teacher and after passing due exams I worked as a German teacher. When the second world war was over and the universities were open again, I studied philosophy and psychology at the Charles University in Prague and took the degree Doctor of Philosophy. As I wasn't allowed to teach or give lectures, I found my occupation in an organization of employees in the education system.

My interest in ferns arose step by step probably 50 years ago. I liked ferns such as Woodsias and Ceterach which were at that time very wanted and difficult to obtain in our country. A suggestion to try to raise ferns from spores led me to the book "Einzug der Gräser und Farne in die Gärten" (Entry of the Grasses and Ferns to the Gardens), written by Karl Foerster, Neumann Verlag, Radebeul 1, 1957. I put a little sterilized turf in a preserving jar, sowed spores of Ceterach officinarum and gave the closed jar a spot on a window ledge. After some days I wasn't able to believe my eyes. The surface was covered with green. By means of a magnifying glass I found out that the spores had germinated and developed to prothalli. After having moved from Prague to Tachov, I used different and rather all kinds of procedures and methods and raised ferns from spores in a heated greenhouse.

Raising ferns from spores is often an adventure. You sow one species and get many different species. Then it is a challenge to solve what kinds of ferns you have. It is often a difficult task which needs much patience and consulting with the literature. A fern journal is a great help.

Call for Papers

Dear Fellow Pteridologists,

As some of you know, I've been asked to organize a symposium on the Conservation Biology of Pteridophytes for the joint annual meeting of the American Fern Society and the Botanical Society of America, August 1998, in Baltimore, Maryland. I'm just now starting to put some thought into potential speakers and would greatly appreciate any thoughts you might have. Ideally, I would like to see a combination of topics including basic and applied research of rare and endangered pteridophytes, ecology, genetics, demography, systematics, habitat restoration etc. So, if you and/or any of your students are working on projects relating to conservation of pteridophytes, please let me know as soon as possible so that I can consider as much as possible in putting together a program. At this point I am NOT aware of the availability of any funds to help with travel expenses, but I will be checking into that.

Looking forward to hearing from you!

Tom Ranker

Curator of Botany & Associate Professor

University of Colorado Museum &

Department of EPO Biology

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Readers & Writers Alert

Your editor is always happy to receive articles and comments and I thank the many members who have contributed to our newsletter. Right now I'm looking for some very specific articles on two different subjects:

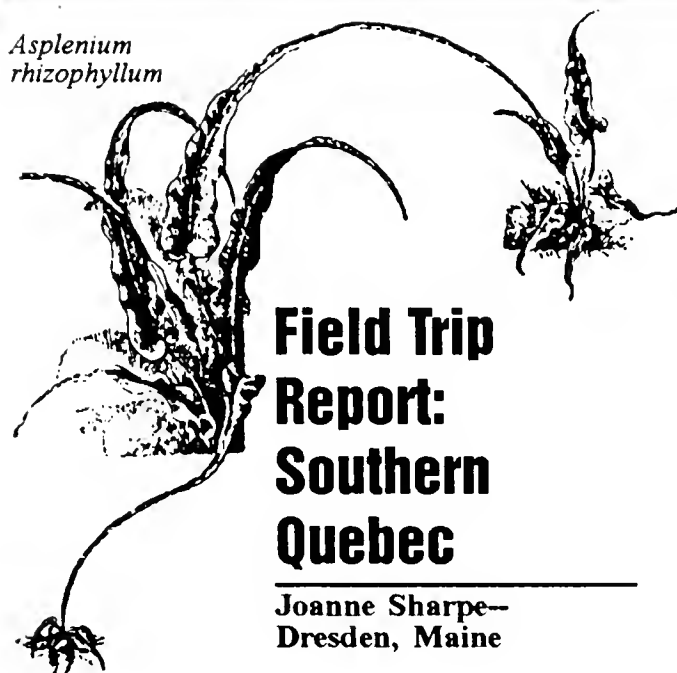
Propagation - how do you grow your ferns from spores? There are almost as many methods as there are propagators and I'd like to hear about yours.

Deer - are they a problem for you? Do you find some ferns more susceptible than others? Who are the good guys?

Thanks!

You may mail articles to me (preferably on a PC disk in Word 6) at 2003 128th Ave. S.E., Bellevue, WA 98005 or send them by e-mail to Foliageg@juno.com.

*Asplenium
rhizophyllum*



Field Trip Report: Southern Quebec

Joanne Sharpe--
Dresden, Maine

Two days of fern field trips in Canada's province of Quebec near Montreal left this participant totally impressed with the pteridological resources and puzzles of the area. The forays were sponsored by the American Fern Society and were held August 2-3, 1997 in association with the meetings of the American Institute of Biological Sciences (AIBS) at the Palais de Congres de Montreal.

We congregated in downtown Montreal on Saturday morning to board our bus with co-leaders Charles Mercier and Jacques Labrecque and were soon off to Mont St-Hilaire which is just west of Montreal. On the bus we were provided with a comprehensive description of Mont St-Hilaire which is a 1200-hectare property owned since 1958 by McGill University. There is a visitor center and facilities for researchers and because of its unique habitats and intact ecosystems, it has been designated a UNESCO Man & Biosphere Reserve. In managing the reserve, McGill has tried to balance visitor and researcher demands within a natural site so close to Montreal that suburban development has been gradually eliminating the buffers provided by more rural uses in the past.

Included within the Mont-Hilaire reserve is the dome-shaped mountain itself, flanked with various types of glacial deposits and small Lac Hertel--which has been divided down the middle into fishing and research uses. In this one 1200-hectare area it is possible to see over 50 species of ferns and fern allies, however because of time limitations our visit was limited to the area around the lake. By my count we saw at least 30 different species in this one area. Our leader for this part of the trip, Charles

Mercier, though a *Carex* researcher at Mont-Hilaire, had proven himself a pteridologist as well, finding localities for some of Quebec's rare ferns near his research sites. Along the lake edge we saw both the broad beech fern *Phegopteris hexagonoptera* and the narrow beech fern *Phegopteris connectilis*, a fern rare in Quebec. We learned that, in spite of its name, the lower pinnae pairs are NOT connected by leaf tissue along the rachis in the latter. A non-fertile population of the uncommon narrow-leaved glade fern *Diplazium pycnocarpon* occurred between the trail and the lake. A single sighting of the triangle moonwort *Botrychium lanceolatum* along the trail led to many more sightings as more eyes (and cameras) joined in the search.

Lake edge examination of several species of lycopods led to much discussion of the various new and old names in this group as well as their cloning habits identified as "guerilla" and "phalanx". In a particularly lush area at the end of the lake we were fortunate to see large populations of the rare (in Quebec) Giant wood-fern *Dryopteris goldiana*. The ground here was carpeted with the bulblet bladder fern *Cystopteris bulbifera* and the silvery glade fern *Deparia acrostichoides*. Large vigorous patches of the northern maidenhair *Adiantum pedatum* abounded as well, providing an excellent setting for photographs of the entire group.

Our next site was in the town of St. Armand-Ouest right on the Vermont border in the southwest corner of the Eastern Township region of Quebec. After parking in the driveway of a lovely farm in the valley, we were led uphill by Jacques Labrecque through mixed woods. On the scattered limestone outcrops we were rewarded with views of the walking fern *Asplenium rhizophyllum* cascading down the sides of a large rock face, with the ebony spleenwort *Asplenium platyneuron* and blunt-lobed cliff fern *Woodsia obtusa* tucked among the crevices. The latter is known from only two other sites in Quebec, all near the border. While the rest of us admired a spectacular view across a ravine to Vermont (and occasionally stepped across the remnants of a barbed wire fence that marks the border at this location), Jacques scrambled down a cliff face to bring us a sample of the extremely rare and tiny wall-rue *Asplenium ruta-muraria* he had recently discovered there only by accident. As

happens with *Botrychium*, we again spotted one specimen of the rattlesnake fern *Botrychium virginianum* only to find we had been walking through a large population. The darker green daisy-leaved moonwort *Botrychium matricariifolium* was not so common however.

Sunday morning saw a somewhat larger group assemble at the Palais des Congres for a trip to the serpentine areas of the Eastern Townships led by Geoffrey Hall. A long discontinuous ridge of serpentine trends southwest to northeast throughout this part of Quebec and is mined for asbestos. Serpentine is a beautiful green rock with large amounts of magnesium and iron. Its composition creates habitat for a suite of plants with very specialized requirements and it is also used for exquisite sculptures seen later in art galleries in Montreal.

The trail to our first serpentine site, overlooking Lac La Ruche, wandered through woodlands where the hay scented fern *Dennstaedtia punctilobula* and the evergreen wood fern *Dryopteris intermedia* were abundant. On the steep rock scree cascading down to the lake we saw several small populations of the western maidenhair *Adiantum aleuticum*. As suggested by its name *A. aleuticum* in its Canadian serpentine locations is disjunct from its western wooded ravine locations. This situation long ago resulted in the hypothesis that parts of the Gulf of St. Lawrence region were unglaciated during the Pleistocene (Paris 1991).

At our next site, Lac Brompton, we were presented with another interesting species of *Adiantum*, the Green Mountain maidenhair *Adiantum viridimontanum*. This species was only recently described (Paris 1991) and is found only on serpentine in north central Vermont and southern Quebec. The population of this regional endemic at Lac Brompton epitomized the term "locally abundant". It grew profusely throughout an area of disturbed serpentine, with various microhabitats ranging from sunny pavement-like scree to shaded woodland resulting in a wide range of growth habits. A small lakeside population of *Botrychium multifidum* provided lunchtime entertainment. A slightly more strenuous scramble after lunch led to one of the steep rock faces near Lac Brompton where the walking fern *Asplenium rhizophyllum* and the

smooth cliff-brake *Pellaea glabella* were seen at their northernmost limit.

For more information and complete lists of the ferns seen on these field trips contact Charles Mercier, 12035 Ronald, Montreal-Nord, Quebec H1G 1V8 (mercier@magellan.umontreal.ca) or Jacques Labrecque, 877 Delage app 3, Saint-Foy, Quebec G1V 3X3 (cdpng@mef.gouv.qc.ca) or Geoffrey Hall, 529 rue Wellington Sud, Sherbrook, Quebec J1H 5E2 (ghall@interlinx.qc.ca).

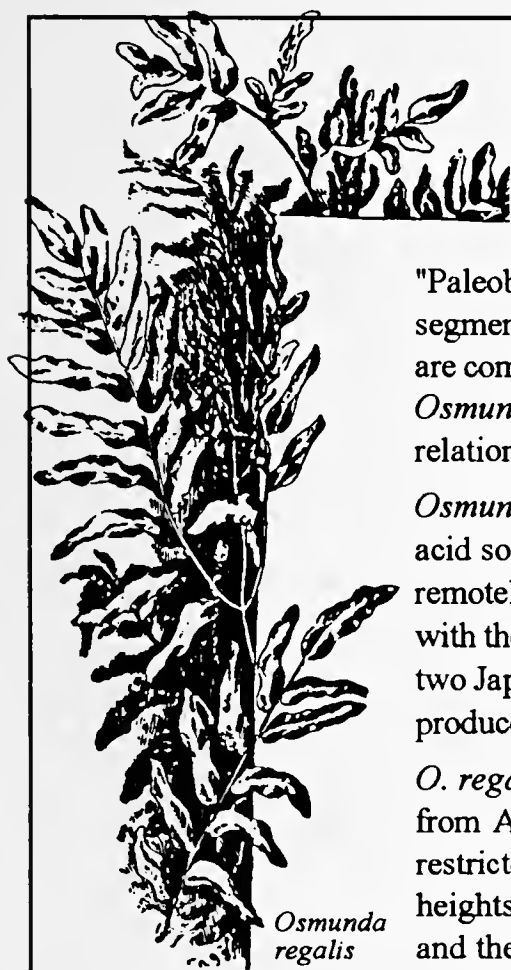
For information on Mont St.-Hilaire contact Martin J. Lechowicz, Dept. of Biology, McGill University, 1205 Avenue Dr. Penfield, Montreal, Quebec H3A 1B1 (Martin@BIO1.LAN.McGill.CA).

For a free comprehensive guide to the Eastern Township region of Canada - call 1-800-355-5755 or e-mail ate@multi-medias.ca.

Reference: Parris, Cathy A. 1991. *Adiantum viridimontanum*, a new maidenhair fern in eastern North America. *Rhodora* 93:105-122.



Woodsia obtusa



Osmunda regalis

Osmunda regalis - The Royal Fern

Jim Horrocks - Salt Lake City, UT

As noted in the HFF Newsletter Vol. 3 Number 4 - The Royal Fern Family, *Osmundaceae*, is a very ancient one, first appearing in late Paleozoic (Upper Permian) strata. Quoting from Thomas N. Taylor's "Paleobotany": "Most information about the fossil history of the family comes from structurally preserved stem segments, many of which have been reassigned to extant genera.Isolated osmundaceous sporangia and spores are common in Mesozoic rocks and are typically identical with extant forms.Although the fossil record of the *Osmundaceae* appears extensive, there are numerous gaps in our knowledge about the origin of the family and relationships among the taxa.

Osmunda regalis, also called the Flowering Fern, is a denizen of swamps and bogs growing mostly in strongly acid soil. It may occasionally be found at the edge of streams and lakes. The fronds are rather unique and only remotely resemble those of *O. cinnamomea* and *O. claytoniana*. In a garden collection, it is likely to be confused with the Japanese species *O. japonica* and may even be confused with *O. lancea*, also from Japan. However, the two Japanese species do not have the spore-bearing pinnae on the upper portion of the frond, as in *O. regalis*, but produce separate fertile fronds that are contracted their entire length.

O. regalis is native to North and South America, Europe, and Great Britain. Varieties of it have been described from Africa, India, and China. In North America it grows usually two to five or even six feet high and is restricted mainly east of the Mississippi river, being rather rare west of it. Specimens from Europe have attained heights of ten feet, the huge fronds being stouter and fleshier. Forms with purple stipes and rachises are known and there are varieties with crisped margins, crested segment tips, and in the case of *var. spectabilis*, the segments are thinner and more widely spaced. *O. regalis* has hybridized with *O. claytoniana* to produce *O. X ruggi*.

Description: The compact rootstock is thick and erect, the crown often twelve inches above the surface. The crown arises from a large circular mound of matted rootlets. The stipe is about 3/4 as long as the blade, in some forms glaucous green, but in others, a reddish color and glabrous. The fronds can be up to six feet in height, the color a pea green. The frond is divided into five to nine pairs of opposite pinnae, each bearing six or more pairs of well-spaced oblong pinnules with oblique bases and obtuse to acutish tips. The fronds have an open graceful look. The fertile fronds are like the sterile except that the pinnules of the top three or four pinnae are greatly contracted and made up of clusters of sporangia which are globular in shape and found on the margins of the pinnules. The sporangia split into two sections as the spores ripen. There is no indusium and the green spores remain viable for about 3 weeks.

Culture: This is a magnificent plant for waterside planting and in bog gardens where it will thrive in standing water. It has also been successfully grown in ordinary garden conditions as long as the soil is enriched with peatmoss and leafmold and kept slightly acid and damp. The fronds grow in clusters that are pyramidal in shape rather than vase-like. In the fall, the fronds have seasonal value as they take on a russet brown color. The Royal Fern spreads slowly and growth occurs in a circumferential manner forming a ring of separate plants all originating from the central specimen. For something really different in the fern bed or water garden, *O. regalis* is certainly worth trying. An impressive bit of "Royalty" is a welcome addition to any garden.

References: *The Fern Guide*, (1961) Edgar T. Wherry, Doubleday, New York *Field Book of Common Ferns*, (1949) Herbert Durand, G.P. Putnam's Sons, New York.

Ferns to Know and Grow (1971) F. Gordon Foster, Hawthorn Books, Inc., New York

Ferns for American Gardens (1994) John T. Mickel, MacMillan Publishing Co., New York

Pteridophytes at The Rockland Botanical Garden, Berks County, Pennsylvania

John Scott, Mestztown, PA

The Rockland Botanical Garden is the privately owned study garden of Mr. & Mrs. John D. Scott, 55 Hertzog School Road, Mertztown, Pa. 19539. The Garden was created in 1977 from four acres of old corn field and nine acres of lumbered woodland. Collections currently being developed include over 450 conifers, 157 hardy ferns, and a nine acre native woodland garden with approximately one mile of maintained trails.

The purpose of the Rockland Botanical Garden is to provide systematic and ecological plant collections for study by students in the field. An extensive fern library and an herbarium of the Garden's plants are being developed. Also under development is a computer file of fern literature and fern names.

The property was selected because of the many varied microhabitats. Four acres of old corn-field provide a sunny area for the conifer collection and an organized dicot collection. Artificial habitats include a limestone cobble and a serpentine barren. There is a small stream and a large spring fed bog. A nine acre woodland contains several hundred indigenous plants native to Berks County. Most notable plants include *Botrychium matricariifolium*, *Orchis spectabilis*, and *Habenaria lacera*.

The large list of indigenous pteridophytes was made during the first few years of surveying the woods. To that collection has been added native North American ferns. There is a small section of the woods devoted to Japanese wild-flowers and ferns. The ferns have been purchased mainly from Fancy Fronds, Foliage Gardens., Siskiyou Gardens, and Wildwood. While the hardiness map places the Garden in Zone 6, most of the purchased ferns listed as Zone 6 do not winter over or send up fronds in June and July. If the hardinesses of the ferns are correct, we have a microclimate of Zone 5.

All the plants listed below are currently growing at the Garden. Those marked "*" have been planted during the Spring of 1997.

Plants indigenous to the property (38)

Adiantum pedatum
Asplenium platyneuron
Athyrium angustum
A. angustum f. *elatus*
A. angustum f. *rubellum*
A. asplenioides
A. thelypteroides
Botrychium dissectum f. *dissectum*
B. dissectum f. *obliquum*
B. matricariifolium
B. simplex
B. virginianum
B. virginianum (blunt lobed form)
Cystopteris tenuis (C. *fragilis* v. *mackayii*)
Dennstaedtia punctilobula
Dryopteris carthusiana (D. *spinulosa*)
D. cristata
D. intermedia
D. marginalis
D. x boottii
D. x Slossonae
Equisetum arvense
Lycopodium digitatum (L. *flabelliforme*)
L. lucidulum
L. obscurum
L. obscurum f. *dendroideum*
Onoclea sensibilis
Osmunda cinnamomea
O. clatoniana
O. regalis v. *spectabilis*
Phegopteris hexagonoptera
Polypodium virginianum
Polystichum acrostichoides
P. acrostichoides f. *incisum*
Pteridium aquilinum v. *latiusculum*
Selaginella apoda
Thelypteris novaboracensis
T. palustris
Woodsia obtusa

Additional North American pteridophytes (48)

Adiantum pedatum (PA serpentine form)
 * *A. pedatum* ssp. *subpumilum*
 * *Asplenium trichomanes* 'Pachyrachis'
Athyrium asplenioides f. *subtripinnatum*
A. distentifolium
A. filix-femina (Oregon)
A. pycnocarpon
Blechnum spicant (Siskiyou Mts., hardy form)
Camptosorus rhizophyllus
 * *Cheilanthes lanosa*
Cystopteris bulbifera
C. protrusa

C. x tennesseensis
Dryopteris arguta
D. campyloptera
D. celsa
D. clintoniana
D. expansa
D. filix-mas (Canada)
D. goldiana
D. x atropalustris (*celsa* x *cristata*)
D. campyloptera x *marginalis*
D. celsa x *spinulosa*
D. clintoniana x *goldiana*
D. clintoniana x *marginalis*
D. x dowellii
D. intermedia x *marginalis*
D. x leedsii
D. ludoviciana
D. x neo-wherryi
 * *D. pseudofilix-mas*
D. x triploidea
D. x uliginosa
Equisetum hyemale
E. scirpoides
Gymnocarpium dryopteris
G. dryopteris plumosum
Lorinseria areolata
Matteuccia pensylvanica
Phegopteris connectilis
Polypodium glycyrrhiza
Polystichum acrostichoides (bifurcate)
Polystichum acrostichoides f. *crispum*
P. acrostichoides f. *multifidum*
P. braunii
P. x potteri (*P. acrostichoides* x *braunii*)
Thelypteris simulata
Woodsia oregana
Woodwardia virginica



Foreign ferns and cultivars (58)

* *Asplenium fontanum*
Asplenosorus x crucibuli
Arachniodes aristata variegata
A. simplicior v. *major*
A. standishii
Athyrium filix-femina (English cultivars)
 'Congestum grandiceps'
 'Cristatum'
 'Fieldii'
 'Frizelliae'
 'Minutissima'
A. niponicum (cultivars)
 'Ancient jade'
 'Barnes dwarf green form'
 'Barnes dwarf gray form'
 'Pictum'
 * 'Ursula's Red'
 'Wildwood La Pampa'
 'Wildwood Tapestry'

A. otophorum
 Blechnum penna-marina
 B. penna-marina (crested form)
 * Crytomium macrophyllum
 Cystopteris bulbifera 'crispa'
 Dryopteris affinis (D. pseudo-mas)
 * D. affinis (pseudo-mas) ssp. affinis
 * D. affinis ssp. affinis 'Cristata the King'
 D. affinis 'Crispa'
 * D. affinis ssp. cambrensis
 * D. affinis ssp. cambrensis v. paleaceo-crispa
 'Crispa Barnes'
 * D. x complexa 'Robust'
 D. cycadina (D. atrata)
 D. bissettiana
 D. championii
 D. x deweveri
 D. dilatata 'Lepidota cristata' (grandiceps)
 D. dilatata 'Recurvata'
 D. dilatata 'Stansfieldii'
 D. erythrosora
 D. erythrosora f. prolificum
 D. filix-mas (English cultivars)
 'Barnesii'
 'Cristata 'Martindale'
 'Pendans'
 (?)
 * cristata
 * D. formosana
 D. gymnosora
 * D. kuratae
 D. lacera
 D. nipponensis
 D. polylepis
 D. purpurella
 D. radeana
 * D. remota
 * D. sacrosancta
 * D. uniformis 'Cristata'
 D. wallichiana
 * Lygodium japonicum
 Osmunda japonica
 * O. regalis 'Crispa'
 * O. regalis 'Cristata'
 * O. regalis var. regalis 'Purpurascens'
 * Phyllitis scolopendrium
 Polysticum. makinoi
 * P. rigens
 P. tripterum
 Thelypteris decursive pinnata
 Woodsia manchurensis
 W. plumeriae
 W. polystichoides



1984 - A Year of Problems for Tree Ferns - Some General Observations

A. G. Sonter, Sonter's Fern Nurseries,
New South Wales, Australia

Our nursery has been producing the tree fern, *Sphaeropteris cooperi* (syn. *Cyathea cooperi*) from spores for more than ten years.

Quite suddenly in 1984, although the spores germinated as usual, the prothalli degenerated and production dropped to almost zero. The same phenomenon occurred simultaneously in nurseries in Perth and Sydney.

About the same time, enquiries began to flood in from tree fern growers around Australia whose production from spores had failed. Within a period of two months growers had contacted us from Darwin, Cairns, Brisbane, Adelaide, Melbourne, and a host of other areas all around Australia, all with the same story - their spore production had failed. Buyers informed us there was an Australia-wide shortage of tree ferns.

Over the next four months we increased our spore sowing tenfold and for the next three months I spent my time trying to solve the production problems.

The following things were tried:

1. Spores were collected from many remote areas around Australia from natural tree fern populations - from Bedford in Western Australia to Atherton in Queensland.
2. Spores were sterilized.
3. A wide range of sowing media were tried, including peat moss, sawdust, pine bark, perlite, vermiculite, and a range of combinations of these.
4. The pH was varied from 4.0 to 8.0.
5. The daylength was varied from 8 to 24 hours.
6. The humidity was varied.

7. A wide variety of fungicides were tried.

Results were no better - the crop still failed.

Numerous samples of prothalli were tested by laboratories around Australia who constantly diagnosed: "no diseases and no pests - it must be an environmental problem".

Suddenly at the end of 1984 most of the prothalli in our trials stopped degenerating and grew beautifully, irrespective of media, light, temperature, etc. The only failures were in the widest ranges of the trials.

It should be noted that prior to 1984 we were producing over 100,000 tree ferns a month from spores, covering a range of about thirty different cultivars, and there were no problems of degenerating prothalli.

By the end of March, 1985, after three months of successful production, most of our grower customers had cancelled their orders because their own production was now "doing nicely". This is being written in May 1985, and there are tree ferns everywhere.

Our nursery has produced many millions of ferns from spores and we have been very conscious that many cultivars can be destroyed by a single factor being out of line, at any time.

It is my considered opinion that the minute, delicate *Cyathea cooperi* spores which are responsive to the most minuscule of variations in the complex balance of environment, media, and nutrients have, during this period of 1984, been indicating to us in a very real way, a change in the earth's total environmental balance. We do not know what changed - perhaps radiation, atmospheric gases, or a host of factors, but we do know that something did happen, and the tree fern spores in their own way told us about it.

Incidentally, we have since sown more of each batch of spores collected around Australia in 1984 and they have all grown successfully, with only normal losses.

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Fern Ratings in Zone 6A

Dear Ms. Olsen:

I live in an area east of Louisville in zone 6a. We have occasional years where the minimum temperature is as low as -15 to -20F. However, our major problem with temperature comes with the sudden spring freezes after a period of warm weather has completely broken winter dormancy. We had one this year which damaged a considerable number of ferns including *Dryopteris marginalis*, *Osmunda* species and *Matteuccia struthiopteris* as well as Japanese maples all over town. Summer temperatures reach the middle upper eighties for average highs. We usually have several periods in the nineties with lows in the seventies at night with 100 percent humidity as well as periods of no Rainfall. All in all a challenging place to raise ferns.

The fern beds are generally on slopes shaded by large hardwood trees ie: oaks, hickory, ash, and maple. One bed is along a creek bank which sometimes runs full with run-off from rain. We had 13 inches of rain this spring in twenty four hours. It washed out some ferns completely as well as undercutting the crowns of others in various beds. I did not include those ferns in my rating as I believe that it was abnormal damage. For this reason the rating list does not contain some ferns in previous inventory lists.

A second creekside bed is on a bank covered with large pieces of crushed limestone rock to control erosion. I have established the 'lime-lovers' in this area. The main problem seems to be slugs or whatever that likes ferns in this situation.

Ralph C. Archer - Louisville, KY

NAME	RATING	YEAR PLANTED
<i>Adiantum pedatum</i>	2	1996
<i>Adiantum venustum</i>	2	1996
<i>Arachnoides simplicior</i> 'Variegata'	2	1996
<i>Asplenium platyneuron</i>	3	1995
<i>Athyrium angustum</i> forma <i>rubellum</i>	4	1994
<i>Athyrium asplenioides</i>	4	1994
<i>Athyrium filix-femina</i> 'Corymbiferum'	4	1995
<i>Athyrium niponicum</i> 'Pictum'	5	1990
<i>Athyrium otophorum</i>	4	1995
<i>Camptosorum rhizophyllum</i>	3	1995
<i>Cheilanthes argentea</i>	0	1996
<i>Cystopteris bulbifera</i>	5	1995
<i>Dennstaedtia punctilobula</i>	3	1993
<i>Dryopteris affinis</i> 'Crispa Gracilis'	3	1996
<i>Dryopteris affinis</i> morph <i>affinis</i>	3	1996
<i>Dryopteris affinis</i> 'Cristata the King'	3	1996
<i>Dryopteris affinis</i> 'Crispa'	4	1995
<i>Dryopteris bissetiana</i>	4	1995
<i>Dryopteris carthusiana</i>	3	1995
<i>Dryopteris complexa</i>	4	1995
<i>Dryopteris cristata</i>	4	1995
<i>Dryopteris dilatata</i> 'Jimmy Dyce'	2	1995
<i>Dryopteris dilatata</i> 'Lepidota Cristata'	2	1995
<i>Dryopteris erythrosora</i>	3	1994
<i>Dryopteris filix-mas</i>	3	1995
<i>Dryopteris filix-mas</i> 'Crispa Cristata'	3	1994
<i>Dryopteris filix-mas</i> 'Cristata Jackson'	4	1995
<i>Dryopteris filix-mas</i> 'Grandiceps'	4	1995
<i>Dryopteris filix-mas</i> 'Linearis Polydactyla'	4	1995
<i>Dryopteris intermedia</i>	3	1995
<i>Dryopteris marginalis</i>	3	1994
<i>Dryopteris nipponensis</i>	2	1995
<i>Dryopteris remota</i>	5	1995
<i>Dryopteris submontana</i>	3	1996
<i>Dryopteris uniformis</i>	3	1995
<i>Matteuccia struthiopteris</i>	5	1990
<i>Onoclea sensibilis</i>	5	1996
<i>Osmunda cinnamomea</i>	5	1993
<i>Phyllitis scolopendrium</i>	3	1996
<i>Phyllitis scolopendrium</i> 'Kaye's lacerate'	0	1996
<i>Polystichum acrostichoides</i>	5	1990
<i>Polystichum lonchitis</i>	0	1995
<i>Polystichum makinoi</i>	3	1995
<i>Polystichum polyblepharum</i>	2	1995
<i>Polystichum tsus-simense</i>	3	1996



Onoclea sensibilis

The Hardy Fern Foundation

NEWSLETTER

The Hardy Fern Foundation Newsletter is published quarterly by the Hardy Fern Foundation, P.O. Box 166, Medina, WA 98039-0166.

Articles, photos, fern and gardening questions, letters to the editor, and other contributions are welcomed!

Please send your submissions to
Sue Olsen, 2003 128th Ave SE,
Bellevue, WA, 98005.

Newsletter:

Editor: Sue Olsen
Assistants: Janet Dalby, Sylvia Duryee,
Sue & Herman Entz
Graphics: Karie Hess

The 1997 HFF Spore Exchange

It is finally that time of year when we can get back to growing the plants that we all love so much. There are again fewer ferns listed and many are getting a little old. We need a big revival of spore donations if we are going to keep this exchange as vibrant as it has been in the past. I have no magic source of spores, all of the spores come from members such as yourself. So let's get out there in the woods or your local HFF satellite garden, or conservatory and ship them out to your fellow ferners post haste!!!

There were 6 donors last year, less then 10% of the members, we can do better. The people listed below made the special effort and sent in spores. They all deserve a thank you from the rest of us, they are listed in random order.

Sylvia Duryee, Iris Gaddis, Keith Rogers, Wendy Born, Jocelyn Horder, Sue Olsen

To Order: Please print your selections clearly in **alphabetical** order (not by number, please) order using the genus, species, and cultivar. Include 25 cents for each fern requested (check payable to the Hardy Fern Foundation) and a **self-addressed stamped envelope**. No charge for overseas members, but please enclose an international postal coupon (2 for larger orders) and an envelope. **Maximum order 25 per year.** Mail requests to:

Wayne "Bubba" Baxter
307 Riverdale Cir.
Stephenson, Va. 22656
USA

Email fernbubb@visuallink.com

The descriptive columns are **Pk** packets available, **Z** the coldest zone this fern has been reported to have grown in, **SZE** in inches, **GROWth** habits listed below, **CollSite** if collected in the wild, **Orig** their natural range, **Donor** Listed by the most recent year the spore was donated followed by the donors number.

1 Rare fern	N Moist soil	B Tree fern
2 New Fern	S Shade	G Spdg habit
3 Few spores	T Part Sun	K Terrestrial
\$ GreenSpore	U Bright Sun	F Aquatic
\$\$\$ GreenSpore with Donor	H High Humidity	V Deciduous
A Alkaline	L Soil Specific	O Evergreen
Z Acid soil	R Rocky Soil	Y Dimorphic
D Dry Soil	C Climber	E Easy 2 grow
W Wet soil	J Epiphytic	Q Hard 2 grow

PS This note is for everyone that has not donated spores, donors please ignore this. The rest of us need to consider that there is no endless source of spores that I can tap into. All of the spores come from members like you. If there are not enough donations then the quality of the whole exchange is affected. Please take time during the next year (it isn't really that much time, I have done it many times myself) to focus on the ferns in your area or country and get them on the exchange. There are ferns that are indigenous to everyone's area (get a fern book out and have a look) that other members can't get otherwise. Many of the spores on the list are old or few in number, even common ferns need fresh spores or their viability plummets. The Hardy Fern Foundation Spore Exchange is a unique institution and with your help it will continue to be the best in the world. Thank you for your help.

DNR	FIRST	LAST	DNR	FIRST	LAST
1	Brian	Aldine	98	Judith	Sullivan
2	Wayne	Baxter	97	John	Thompson
4	Wendy	Born	99	Christian	Wingard
5	Mrs Alice J.	Burkman	99	Dr Bruce	Young
6	Anna Marie	Davis	100	Maria	Beard
7	Sylvia & Phil	Duryee	101	Margaret	Nimmo-Smith
8	Leslie	Duhie	102	E. MD	Hirsch
9	Patrick	Dwyer	103	Richard	Pitts
10	Sue	Entz	105	Bryan J.	Leuchland
11	Iris	Gaddis	106	Berry	White
12	William	Gessner	107	Beverly	Edney
13	Chris	Goudy	108	Catherine	Quiles
14	Eldred	Green	109	Phyllis P.	Bates
15	Greg	Haines	110	Linda and	Halley San
16	Neil	Hall	111		HFF
17	Marguerite	Hartmann	112		AFS/NYBG
18	Kenneth	Hartman	113	Neud	Burnett
19	Leslie	Hartfield	114	J. C.	Purlier
20	Jocelyn	Horder	115	Ortchen	Gould
21	JR	Horricks	116	Ruthie	Qario
22	Barbara Joe	Hoshizaki	117	Dr. Donald	Farrar
23	Guy	Huntley	118	Charrin	Thout
25	Judith	Jones	119	Elna C.	Link
26	Harold Dr.	Keeper	120	Dr Al	Dirksen
27	Dr. Irving	Knobloch	122	Mrs Hiroko	Sasahri
28	Margen	Kruebers	123	Betsy	Feuerstein
29	Robert W.	Lake	124	Michael	Garnett
30	Donald	Leslie	125		HFF Lakewood
31	Stuart	Lindsay	126	Jason	Hay
32	Lynn	Makela	127	Ted	Evara
33	John & Margot	Maschelli	128	James A.	Rollins
34	Dr. John T.	Michal	129	MICHAEL	HEIM
35	Mary	Muller	130	Lynd & Vera	Barton
36	Sue	Olsen	131	Robert	Muller
37	Barbara S.	Pariss	134	Sandra	Constantino
38	Karla M.	Petkus	135	Wim	Tavernier
39	Ken	Pfeiffer	136	D.J.	Batten
40	John & Grace	Purman	138	Cynthia	Ferden
41	Martin	Richard	139	Jack	Schisler
42	Jim	Ruch	140	Alan	Smith
43	Prof.	Selti	142	Jesse	Perry
44	Kevin W.	Sanford	143	Wally	Reed Jr
45	PhDr. Zdenek	Selbert	144	Jean	Lundberg
46	John & Irma	Sie	146	sue	manderville
49	William	Thomson	147	Dr. Howard	Hinde
50	Fred &	Timm	148	Mary Ellen	Towning
52	Samuel	Turney	149	Judy	Quintochi
53	Dr. T.W.	Turney	150	Jens Henrik	Nielsen
54	Dr. Cor	Van de	151	Marlene	Fairbourn
55	Mrs. Sandra	Vandermast	152	Moore	Huie
56	Suzette	Vicentin	153	Owen	Hammarsberg
57	Les	Vulcz	155	Brian E.	Nash
58	Bruce	Wakeman	156	Peggy	McOll
59	Elmo	Weeks	157	Stephen J.	Copkins
60	Reginald	Kane	158	Claire	Minne
61	Jaroslav	Cuba	159	Nancy	Sherlock
62	John	Adkins	160	Stanislava	Hoskova
63	Don	Agostinelli	161	Dan	Bayer
64	Diane & Ken	Atterbury	162	Daniel	Yensure
65	Roger	Boyles	163	Ann	Hartington
66	Dorothy	Byer	164	Joost	Nekamp
67	Edmund	Cave	165	Harold	Frank
68	Ellen	Claude	166	Ivan	Strulovier
69	Michael	Concannon	167	Leanne	Parsons
70	Lothar	Denkewitz	168	Gerald	Kranz
71	Don & Joyce	Orts	169	Lyle	Winkal
72	Joseph	Ehlers	170	Frank	Damgaard
73	John	Geme	171	Mich	Day
74	Robert	Gemin	172	Frank	Pepi
76	John	Kuue	173	Peter	Podenas
78	Jean	Grabar	174	Carolyn	Stamm
77	Leura	Gustin	175	Fran	
78	Edward	Hallman	176	Joan	Gottlieb
80	David	Hughes	177	Shane	Berry
81	Yoshio	Kato	178	Fran	Rice
82	Shuzo	Kawabata	179	Janet	Yang
83	John	Knouse	180	Don	Lueth
84	Helma Mrs	Kuhns	181	Roger	Hughes
85	Dorothy	Lamb	182	Angele	Randall
86	Dr. David B.	Leffinger	183	Dr. James	McClements
87	John and	Merley	184	Aaron	Edwards
88	Hiroki	Miyazaki	185	Prof P.	Berthet
89	Ferns	Moscati	186	Fabien	Ahrens
90	Crain	Sault	187	Jean	Leecouf
91	Dr. Elizabeth	Sheffield	188	Clive	Jerry
93	Frank Mrs	Stout	189		Anonymous
94	Nel	Sorley	190	Norman	Mustin
95	Dr. David	Straney	191	Susan	McQueen
			DNR	FIRST	LAST
			192	Ben	van Wierst
			193	Douglas	Diamond
			194	Robert	Halley
			195	Dave	Abbott
			196	Keith	Rogers
			197	H. John	Barnes
			198	Tim	Keech
			199	Michael	Richards

H#	GENUS	SPECIES	CVR	PK	Z	SZE	GRO	COLL.SITE	ORIG	DONOR
1	Adiantum	aethiopicum		6	7	32	2TWGE		NzAusAfr	97/7
2	Adiantum	aleuticum		25	4	12	TKGELN		PacNW Jap	96/10 94/97
3	Adiantum	aleuticum	serpentine ecotype	10	2	12	IGJELN		alaska,nw usa	92/25
4	Adiantum	aleuticum	subpumilum	2	3	12	1ZSNEG		NW N.hem	96/20 95/36
5	Adiantum	diaphanum		5	8	10	3EWSHZ		Aust,NZd, Fiji, Norfolk	96/1 94/9
6	Adiantum	hispidulum		15	8	14	SNTEZH		AusEHemTrop	97/181
7	Adiantum	pedatum		25	2	20	ENSZK		US Jap	97/173 96/18
8	Adiantum	Pedatum	Miss Sharples	2	3		2NSZ		US	96/173
9	Arachniodes	anastata	variegata	20	6	36	SZND		Easia, Aust.	96/10,156
10	Arachniodes	miqueliana		2	5	24	GK		Easia	95/12 92/43
11	Arachniodes	simplicior		15	6	30	EKTZM		Easia	97/181
12	Arachniodes	simplicior	variegata	10	7	30	SNEM		Easia	97/182 96/146
13	Arachniodes	standishii		10	6	18	TNKM		JpKor	96/157 95/70
14	Arthroptens	Orientalis		5	8	18	ZSJW		Afr	94/149
15	Aspidium	aculeatum		2	6				NEur	94/9
16	Asplenium	adiantum-nigrum	adiantum-nigrum	50	6	14	RANT		Eur.NA.Af	97/7,193 96/45
17	Asplenium	adiantum-nigrum	Silesiacum	1	6	14	RANT		Eur	96/45
18	Asplenium	billotii		1	5	10	QZTK		Eur	95/10 94/9
19	Asplenium	cuneifolium		16	6		R		Eur	94/45
20	Asplenium	Dahlhousia		1	7	10	1RK		AzoresHimalav	
21	Asplenium	flaccidum	terestre	3	8	30	NTK		Aus	96/164 94/110
22	Asplenium	fontanum		4	5	5	ZNRSG		Eur	96/45 94/9,97
23	Asplenium	fonsiense		4	8	6	ATRN		Eur	95/135 94/9
24	Asplenium	Lunulatum		1	8	18	SH		S.Af	95/53
25	Asplenium	Milnei		5	8	32	12ESN		AusLrdHowelsI	97/196
26	Asplenium	monanthes		1	7	12	1RTNZ		S.US,SAmAFWIndies	97/7
27	Asplenium	Nesii		2	8	8	12K		Tien-Shan	96/45
28	Asplenium	nidus		20	8	60	HZNTJK		N.Guin.iap,ryukyu Is.	95/9,166 94/11
29	Asplenium	nidus	Avis	5	8	60	2HZNTJ		N.Guin.iap,ryukyu Is.	96/158
30	Asplenium	obliquum		5	8	48	KATNH		NZ	92/116
31	Asplenium	oblongifolium		18	8	48	SNK		Nz	97/11,196 95/9
32	Asplenium	obovatum	lanceolatum	10	7	6	ATNH		Eur	95/9 94/154
33	Asplenium	onoptens		3	6	8	1RZKNT		Eur	96/45,185 95/9
34	Asplenium	pinnatifidum		3	5	5	ZNSK		E USA	97/193,83
35	Asplenium	platyneuron		15	4	18	DAENT		E USA	97/173 96/8
36	Asplenium	Praenoides		5	8	24	2NSE		Aus	97/196
37	Asplenium	rhizophyllum	large form	10	4	12	ANTKO		NAm	96/173
38	Asplenium	ruta-murana		10	4	5	QANU		N. Hem	96/45 95/9,150
39	Asplenium	Scleroprium		6	6		KSNE		NZ	97/196
40	Asplenium	scolopendrium		8	6	12	ANSKO		NHem	94/150,152,97
41	Asplenium	scolopendrium	Americanum	20	6	12	ANSKO		NHem	97/173
42	Asplenium	scolopendrium	AmericanumForkedFronds	20	6	12	2ANSKO		NHem	96/173
43	Asplenium	Scolopendrium	Supra marginatum	5	6	12	ANSKO		NHem	97/155
44	Asplenium	scolopendrium	Undulatum	4	6	12	2ANSKO		NHem	97/173
45	Asplenium	septentrionale		4	4	6	1QZDTK		NHem	96/45
46	Asplenium	septentrionale	septentrionale	3	4	5	1QZDT		N. HEM	95/9,2
47	Asplenium	trichomanes		10	2	9	ANTKOE		Cosmo	96/164,173
48	Asplenium	Trichomanes	Hastatum	3	2	9	1ANTE		Switz	96/45
49	Asplenium	trichomanes	Incisum	6	2	9	1ANTE		Eur	96/45,158 94/36
50	Asplenium	trichomanes	Lovisianum	2	2	9	2ANTKO		Switz	96/45
51	Asplenium	trichomanes	lucanum	9	2	9	ANTE		Austria	96/45
52	Asplenium	trichomanes	maderense	3	2	9	ANTE			
53	Asplenium	trichomanes	Metzeranum	3	2	9	ANTE		Austria	96/45
54	Asplenium	trichomanes	Moravicum	1	2	9			Moravian	96/45
55	Asplenium	trichomanes	Pachyrachis	4	2	9	1ANTE		Czech	96/45
56	Asplenium	trichomanes	quadriyalens	10	2	9	ANTE		Eur	96/45 95/9
57	Asplenium	trichomanes	trichomanes	3	2	9	ANTE		Eur	95/61 94/45
58	Asplenium	x lusaticum		2	5	9	13		Germ	96/45
59	Asplenium	xposcharskyanm		3	5				Germ	94/45
60	Asplenoceterach	x Badense		1	8				Eur	95/61
61	Asplenosorus	x ebenoides		5	7	12	1ANRK		NAm	96/36,153,173
62	Astrolepsis	sinuata		5	6	10	AUDK		TexMex	95/11
63	Athyrium	asplenoides		2	3	48	EKNZS		SE USA	94/9 93/9 92/9
64	Athyrium	deltoidofrons		1	6	24	TK		Jap,Ch.Kor	96/45 92/88
65	Athyrium	distentifolium		8	3	24	RTVKN		far N Hem	95/12,8
66	Athyrium	filix-femina		40	3	48	ZNTKEV		N. HEM	97/181,108
67	Athyrium	filix-femina	Anqustum	5	3	48	ZNTKEV		N. HEM	96/129
68	Athyrium	filix-femina	Asplenoides	1	3	48	ZNTKEV		N. HEM	95/9
69	Athyrium	filix-femina	Bornholmense	1	3	48	ZNTKEV		NEur	
70	Athyrium	filix-femina	Corymbiferum	2	3	48	3ZNTKO		N. HEM	96/174 94/45
71	Athyrium	filix-femina	cnstatum	15	3	48	ZNTKEV		N. HEM	96/174 95/141
72	Athyrium	filix-femina	cnstulatum	15	3	48	ZNTKEV		N. HEM	96/174 95/141
73	Athyrium	filix-femina	Cruciato-cnstatum	5	3	48	ZNTKEV		N. HEM	96
74	Athyrium	filix-femina	CurtumCristata	4	3	48	ZNTKOV		N. HEM	96/45
75	Athyrium	filix-femina	Frizelliae	4	3	48	ZNTKEV		N. HEM	96/173 95/2
76	Athyrium	filix-femina	Grandiceps	2	3	48	2ZNTKE		N. HEM	96/173
77	Athyrium	filix-femina	Minutissimum	20	3	48	ZNTKOV		NUsa	96/174,173 95/2
78	Athyrium	Filix-femina	multifidum	3	3	48	ZNTKOV		N.Hem	94/141
79	Athyrium	Filix-femina	Polydactylus Darley Dale	1	4	48	ZNTKOV		NHem	94/45
80	Athyrium	filix-femina	redstipes	8	3	48	ZNTKEV		N. HEM	96/52 93/12
81	Athyrium	filix-femina	rubellum	8	3	48	ZNTKEV		N. HEM	97/181 95/156
82	Athyrium	Filix-femina	Rubripes	8	3	60	1ZNTKOV			94/148
83	Athyrium	filix-femina	Sitchense	1	3	48	ZNTKEV		USA	
84	Athyrium	filix-femina	Vernoniae cnstata	20	3	36	ZNTKEV		N. HEM	96/174,182
85	Athyrium	filix-femina	Victoriae	5	3	48	ZNTKEO		N. HEM	97/156 96/10
86	Athyrium	Goeranqianum Pictum	Samarai Swords	5	5	24	2E		Easia	97/173
87	Athyrium	niponicum		1	4	18	ZNTV		Easia	96/181 94/9
88	Athyrium	niponicum	Metallicum	3	4	18	EZNTV		Easia	
89	Athyrium	niponicum	Pictum	60	3	18	ZNTVE		Easia	97/181
90	Athyrium	niponicum	Pictum Tall type	8	3	24	ZNTVE		Easia	96/182

HFF	GENUS	SPECIES	CVR	PK	Z	SIZE	GRO	COLL.SITE	ORIG	DONOR
91	Athyrium	Obovatum		2	5					96/173
92	Athyrium	Otophorum		20	4	24	SKENT		Easia	97/7.11
93	Athyrium	pvcnocarpon		20	4	48	ANTVK		N Am	97/173.52.156
94	Athyrium	rubripes		1	6		3		Siberia	94/45.93/9
95	Athyrium	Thelypteroides		20	3	36	TWZV		NHemS&Easia	97/108.96/181
96	Athyrium ?	Unk.	Bradford Beauty	2	5		2K			96/173
97	Athyrium	vidalii		10	3	24	TKE		Ko.Jp.Tai	96/173.94/45
98	Athyrium	yokoscense		6	4	10	K		Kunles.Easia	97/7.96/45.93/36
99	Azolla \$\$\$	Caroliniana		10	8	1	EFWGH		N Am	95/2
100	Azolla \$\$\$	Filiculoides		10	6	1	EFWGH		Cosmo	95/2
101	Blechnum	Ambiquum		6	8		K		Aus	95/106
102	Blechnum	Capense ?		5	7				NZ	96/36
103	Blechnum	chambersii		25	8	16	WK	Aus	Aus.NZ.Poly	97/106
104	Blechnum	discolor		20	5	38	WTKN		NZ	97/162.95/9
105	Blechnum	fluviatile		40	8	24	RSHWK	Aus	Aus. NZ	97/162.106
106	Blechnum	fraserei		9	8	24	2RSHW		NZ	97/162
107	Blechnum	Lehmannii		10	8					96/162
108	Blechnum	minus		20	6	40	WOTK		Aus. NZ	97/57.106.95/9
109	Blechnum	minus x wattsii		5	6	12	WUK		AusNZ	97/57
110	Blechnum \$	nudum		20	8	40	SZWNK		Aus. Af	94/106
111	Blechnum	penna-marina		10	5	9	GUOWR		SHem	97/193.95/160
112	Blechnum	Procerum		10	8	30	KS		EindiesMexNZ	97/162.95/9
113	Blechnum	spicant		30	5	28	ZESWY		N. Hem. Pac nw	97/199.96/36.34
114	Blechnum	spicant	Crispum	2	5	24	ZESWY		N. Hem	97/36.95/36
115	Blechnum	spicant	Redwood giant	2	4	30	NTYK		N. Calif	97/36.94/4
116	Blechnum	Wattsii		5	6	12	2WUOS		AusNZ	97/57.106
117	Botrychium	dissectum	dissectum	6	3	8	QLZTNK		N Am	97/189.93/9
118	Botrychium	dissectum	obliquum	6	4	8	QLZTNK		N Am	97/189.93/120
119	Botrychium	texnatum		4	8		QLZT		Japa	93/43
120	Botrychium \$\$\$	Virginianum		10	3	16	QZVSKM		NHem	97/195.95/8
121	Camptosorus	rhizophyllus		4	3	6	INTAOK		E NAM	97/156.96/161
122	Campyloneurum	anquistifolium		15	8	24	HSNJ		C&S Am	96/164.95/165
123	Cheilanthes	alabamensis		8	6	18	DUAK		S. US. C Am. W indies	92/104
124	Cheilanthes	argentea		8	4	6	DUZK		Nasia. Siberia	96/150
125	Cheilanthes	Distans		15	7	7	DTZK		Aus. NZ	96/1.18.92/104
126	Cheilanthes	Eatonii		8	4	10	DUAR		SW US	94/20.145.146
127	Cheilanthes	Feei		4	5	8	QRADU	Wisc.	NW N. Am	97/198.1
128	Cheilanthes	lanosa		6	5	12	NSZKO		Se N. Am	96/173.95/8
129	Cheilanthes	lasiophylla		16	8	15	DUK		Aus	97/173.96/150
130	Cheilanthes	lendiqera		2	8	10	1DUKE		S. Tex. Az Mex	94/11
131	Cheilanthes	Persica		3	8		2DUR		Turkey	96/45
132	Christella	subpubescens		3	8	24	QSWK		JpAusMalayPhilip	93/43
133	Colysis	Hemionitidea		3	8	12	KHSJ		EasiaSasia	96/3
134	Colysis	wrightii		1	8	12	NR		Easia	94/27
135	Coniogramme	intermedia		4	7	36	GWZTO		EasiaIndia	95/106
136	Coniogramme	japonica		2	7	48	NSK		E. asia	95/157.93/9
137	Cornopteris	crenulatoserrulata		5	6	36	SNK		Easia	95/12
138	Cryptogramma	acrostichoides		10	2	10	ZURDAK		W US	94/1.92/97
139	Cryptogramma	Crispa		25	6	8	NUAK		EurWasiaAf	96/20.185
140	Cryptogramma	Stelleri		1	3	6	2RDG	Wi	nNAM. Nasia	97/198
141	Ctenitis	Maximowicziana		8	8	24	KO		Jap	95/88
142	Culcita	Macrocarpa		4	8	58	ZNSHOE		SpainAzores	97/187.95/9
143	Currania	dryopteris		1	6	9	3GNSK		NHem	92/8
144	Cyathea	australis		40	8	120	BUZNK		Aus. NZ	97/193.57
145	Cyathea	Brentwood		20	8	200	B		Aus	96/87
146	Cyathea	brownii		60	8	200	1BTNEK		Norfolk is	97/57.96/87.117
147	Cyathea	cooperi		20	8	200	BWTK		AusNZ	96/177.94/94
148	Cyathea	cooperi	blue form	15	8	200	1BWSK		AusNZ	96/87
149	Cyathea	cooperi	Brentwood	20	8	200	1BWS		Aus	96/177.92/87
150	Cyathea	cooperi	Cinnamonia	20	8	200	2BWTK		SydneyAus	97/196
151	Cyathea	cooperi	Coastal form	20	8	200	BWTK		AusNZ	96/177
152	Cyathea	smithii		20	8	200	1BTNK		NZ	97/162.95/9
153	Cyathea	Tomentosum		10	8	72	BN		NGuinea	94/94
154	Cyathea	Woolisiana		8	8	120	BUZNK		Aus. NZ	97/106.96/87
155	Cyclosorus	Interruptus		6	8	48	KWEU		S&EasiaAus	95/106
156	Cyrtomium	caryotideum		4	6	24	ZNTKEO		India. Easia. Hawai	96/173.94/156
157	Cyrtomium	falcatum		50	6	24	RTNEKO		E&Sasia	96/158.95/9.157
158	Cyrtomium	falcatum	Crested	7	6	24	RTNEKO		E&Sasia	95/163
159	Cyrtomium	falcatum	Rochfordianum	5	6	20	RSNEKO		Jp. ChKor	93/36.92/7.97
160	Cyrtomium	fortunei		50	5	24	ZNTKEO		JpChKor	97/182.156
161	Cyrtomium	Lonchitiforme		8	6	12	EK		China	97/11.95/150
162	Cyrtomium	Unk	Litorale	10	5		K			96/173
163	Cystopteris	alpina	Regia	5	5	12	SNA		Eur	95/150.93/12
164	Cystopteris	dickieana		9	5	10	NTAVR		EurNAM	94/12.45.97
165	Cystopteris	fragilis		50	4	12	ZNTVKE		Cosmo	97/1.96/164.24
166	Cystopteris	fragilis	lanthnscifolia	3	2	16	3ZNTKEK		Cosmo	94/45
167	Cystopteris	fragilis	Fine Form	2	2	12	EZNTVK		Cosmo	94/24
168	Cystopteris	protusa		1	5	16	NTEGK		E US	96/174.156.8
169	Cystopteris	sudetica		6	5	10	GK		Eur. Easia	94/12.45.93/9
170	Davallia	Griffithiana		2	8	20	EG		Easia	97/191.95/160
171	Davallia	Plumosa		5	8	18	2TN		Samoa	97/196
172	Davallia	Plumosa	Samoa	5	8	18	2TN		Samoa	97/196
173	Davallia	species		2	8				taiwan	94/12
174	Dennstaedtia	punctiloba		10	3	18	UNGVKE		N A.	97/181.83
175	Deparia	Acrostichoides		20	3	36	TWZV		NHemS&Easia	97/198
176	Deparia	japonica		2	8	10	NEK		IndiaNZJp	95/27.93/26
177	Deparia	petersonii		9	8	22	Gs		Georgia	96/1
178	Dicksonia \$\$\$	antarctica		30	8	120	BSUNK		AusTasmania	97/57.196
179	Dicksonia \$\$\$	fibrosa		10	7	120	1BEONU		NZ	95/9.94/25
180	Dicksonia	lanata		3	8	90	BZSWK		NZ	97/162

HFF	GENUS	SPECIES	CVR	PK	Z	SIZE	GRO	COLL.SITE	ORIG	DONOR
181	Dicksonia	sellowiana		4	8	120	1BSWNE		C&S Am.	97/11 92/9,106
182	Dicksonia	squarrosa		9	8	120	1BTNOK		NZ	97/162,57
183	Dicksonia	youngiae		5	8	120	1BENT		Aus	92/9,87,106,114
184	Diphasiastrium	Complanatum		2	2	8			N NAm	94/9
185	Diplazium	Acrostichoides		9	5		IK		Ny	96/173
186	Diplazium	Assimile		11	8	60	IKWS		Aus	95/106
187	Diplazium	chinense		1	8	24	13		Easia	93/43
188	Diplazium	Mettenianum	tenuifolium	6	8	24	IKV		Jap	95/88
189	Diplazium	Plantaginifolium		20	8				Venez.	96/11
190	Diplazium	pycnocarpon		4	3	32	WS		E. N.A.	94/8 93/9
191	Diplazium	Tomataroanum		5	8	5	2RM		ChJap	97/191
192	Doodia	Aspera		15	6	15	UNG		Aus,NZ,Norf is	95/9,157 94/94
193	Doodia	media		20	7	10	TWNZR		AusNZ Nrfolk Island	95/9,170
194	Doodia	media	australis	1	8	10	TWNZR		NZAusNewCaled	94/1,135,10
195	Doodia	media	Cairns	20	7	10	TWNZR		AusNZ Nrfolk Island	94/94 93/1,109
196	Dryopteris	abbreviata		8	5				Eur	94/45
197	Dryopteris	aemula		1	6	20	1SNKEHM		W.Eur	
198	Dryopteris	affinis		10	3	48	1SNTKE		Eur SWAsia	96/158 95/12,2
199	Dryopteris	affinis	affinis	12	3	48	1SNTKE		Eur SWAsia	96/45,153 95/9
200	Dryopteris	affinis	affinis punctata	10	3		1SNTKE		Eur SWAsia	
201	Dryopteris	affinis	azoncum	2	3	48	1SNTKE		Azores	96/45
202	Dryopteris	affinis	borreri	20	3	48	1SNK		Eur SWAsia	96/45 95/135
203	Dryopteris	affinis	borreri Pseudodisjuncta	20	3		1SNTKE		Eur	96/45
204	Dryopteris	affinis	borreri robusta	20	3	48	1SNK		Eur SWAsia	96/45 94/135
205	Dryopteris	affinis	cambrensis	20	3	36	1SNTKE		Eur SWAsia	96/45,153,185
206	Dryopteris	affinis	Coriacea	4	3	24	1SNTK		Iran	96/45
207	Dryopteris	affinis	Crispa	1	3	48	1SNTKE		Eur SWAsia	97/173
208	Dryopteris	affinis	Crispa stableri	5	3	48	1SNTKE		Eur SWAsia,Eng	94/25 93/36
209	Dryopteris	affinis	Cristata "The King"	5	3	48	1SNTKE		Eur SWAsia,Aus	97/57 94/45,97
210	Dryopteris	affinis	diploid indef?	4	3	48	1SNTKE		Eur SWAsia	96/45
211	Dryopteris	affinis	disiuncta	6	3	48	1SNTKE		Eur SWAsia	96/45 92/9,26
212	Dryopteris	affinis	Persica	30	4	48	1SNTKE		Eur SWAsia	96/45 92/26
213	Dryopteris	affinis	Pinderi	4	3	48	1SNTK		Eur SWAsia	94/150
214	Dryopteris	affinis	Polydactyla	12	3	48	1SNTKE		Eur SWAsia	96/153
215	Dryopteris	affinis	Polydactyla Dadds	12	3	48	1SNTKE		Eur SWAsia	96/153 93/125
216	Dryopteris	affinis	pseudodisjuncta	5	3	48	1SNTKE		Eur SWAsia	92/9
217	Dryopteris	affinis	punctata	4	3	48	1SNTKE		Eur SWAsia	96/45 92/9,26
218	Dryopteris	affinis	robusta	8	3	48	1SNTKE		Eur SWAsia	93/100 92/9
219	Dryopteris	affinis	stillupensis	4	3	48	1SNTKE		Eur SWAsia	
220	Dryopteris	affinis	The King	6	3	48	1SNTKE		Eur SWAsia	94/141
221	Dryopteris	amurensis		15	3	24	1SWKE		Jp,Siberia	94/12
222	Dryopteris	ardechensis		14	8		1SN		France	94/45,24 93/9
223	Dryopteris	arguta		10	8	18	1DTKEO		W. N.A.	97/36 94/97
224	Dryopteris	atrata		30	6	18	1NTK		Easia	96/185 95/2
225	Dryopteris	austriaca	Recurvata	4	3	48	2OSNK		N. Hem	96/173
226	Dryopteris	Barnsii		4	5	24			eUS	95/156
227	Dryopteris	bissetiana		5	3	24	1SZKEN		Jp	97/156
228	Dryopteris	blanfordii		20	3	36	IK		Him	96/45 95/12 93/9
229	Dryopteris	Borreri	pinden	2	4	48			Eur,SWAsia	94/9
230	Dryopteris	cambrensis		7	6				Eng	97/188 92/24,26
231	Dryopteris	carthusiana		10	2	30	1TZWKE		Europe, N Am	97/173,83 96/45
232	Dryopteris	caucasica		20	3	34			Caucasian mt	96/45 95/12
233	Dryopteris	celsa		60	4	40	1ZTWOK		E US	97/197,181,156
234	Dryopteris	championii		25	3	24	1OKNT		Easia	96/173 94/10
235	Dryopteris	clintoniana		5	3	40	1WSKE		E NA	95/141,5 92/26
236	Dryopteris	clintoniana	hexaploid	1	3	40	2WSKE		E NA	96/173
237	Dryopteris	contorta	notho complexa	4	8				Eng	93/24
238	Dryopteris	corlewi		19	8				N. Spain	96/185 94/104
239	Dryopteris	crassirhizoma		10	3	36	1TVKE		Ko,Ch,Jp	96/173 94/45
240	Dryopteris	crassirhizoma	nakai	4	5	36	1TVK		Japan	
241	Dryopteris	cristata		60	3	36	1ZWSKE		N. HEM	97/197,108
242	Dryopteris	cycadina		40	5	30	1NUKE		Easia	97/7,197
243	Dryopteris	cystolepidota		15	7	10	1NSK		JapCh	94/38
244	Dryopteris	dickinsii		15	7	24			Ch,Jp	96/45 95/12 93/9
245	Dryopteris	dickinsii	Incisa	2	8	24			ChJp	94/45
246	Dryopteris	dilatata		25	4	40	1WTOSK		NHem,GreenInd	97/173 95/12,2
247	Dryopteris	dilatata	Crispa Whiteside	26	4	36	1WTOSK		N Hem	95/135,36 94/25
248	Dryopteris	dilatata	Jimmy Dyce	17	4	20	1WTOSK		NHem.	97/197 95/146
249	Dryopteris	dilatata	Lepodota cristata	15	4	18	1WTOSK		N Hem	94/25 92/97
250	Dryopteris	dilatata	Recurvata	6	4	36	1WTOSK		N Hem	97/182
251	Dryopteris	erythrosora		35	5	28	1TNKO		ChJpKr	97/188,181,156
252	Dryopteris	erythrosora	Prolifica	8	5	16	1TNKO		ChJpKr	96/156,20
253	Dryopteris	erythrosora	white son form	5	5	16	1TNKO		ChJpKr	92/25
254	Dryopteris	expansa		30	3	30	1RTNE		NHem	96/20,34 95/9
255	Dryopteris	Expansa ?	small asian	8	5		IK		Asia	95/12
256	Dryopteris	filix-mas		9	3	60	1ZSNVE		N Hem	96/27 95/8,5
257	Dryopteris	filix-mas	Barnsii	20	3	36	1ZSNVE		N Hem	96/153,156
258	Dryopteris	filix-mas	Cristata	60	3	48	1ZSNVE		N Hem	93/120,131
259	Dryopteris	filix-mas	CristataAnqustatum	4	3	8	1ZSNVE		N Hem	97/173
260	Dryopteris	filix-mas	CristataFilmy type	20	3	60	1ZSNV		N Hem	93
261	Dryopteris	filix-mas	CristataJackson	3	3	48	3		N Hem	94/45
262	Dryopteris	filix-mas	CristataMartindale	10	4	48	1ZSNOKE		N Hem	96/153 95/141
263	Dryopteris	filix-mas	Grandiceps	15	3	36	1ZSNVE		N Hem	96/153 94/9,25
264	Dryopteris	filix-mas	Lineans	17	4	36	1ZSNOKE		N Hem	95/141 94/12
265	Dryopteris	filix-mas	LineansPolydactyla	30	3	48	1ZSNVE		N Hem	97/182 95/2,157
266	Dryopteris	filix-mas	Lux-lunae polydactyla	10	4	60	1ZSNOK		N Hem	95/159
267	Dryopteris	filix-mas	Martindale	7	4	48	1ZSNOKE		N Hem	94/141
268	Dryopteris	filix-mas	polydactyla	5	4	48	1ZSNOKE		N Hem	94/141
269	Dryopteris	filix-mas	Polydactyla Dadd's	7	4	48	1ZSNOKE		N Hem	95/135
270	Dryopteris	filix-mas	small erect type	14	3	48	1ZSNVE		N Hem	94/12 93/12

HFF	GENUS	SPECIES	CVR	PK	Z	SIZE	GRO	COLL.SITE	ORIG	DONOR
271	Dryopteris	filix-mas	Straberi	9	3	48	ZSNVE		N Hem	96/158 95/2
272	Dryopteris	filix-mas	sublinearis	11	4	48	ZSNOKE		N.Hem	94/141
273	Dryopteris	filix-mas	undulata robusta	25	3	60	ZSNVE		N Hem	95/108 94/97
274	Dryopteris	fructuosa		15	8	48	INSK		Tawindia	93/43 92/26.43
275	Dryopteris	goenngiana		8	3					96/21 94/9.97
276	Dryopteris	goldiana		15	3	48	TNVKE		N Am	97/173.83.108.1
277	Dryopteris	goldiana hyb. ?	x D. clintonia ?	7	3	48	SN		CT	94/39
278	Dryopteris	Goldiana x Clintoniana		15	3	48	2TNVKE		N Am	96/173
279	Dryopteris	Gymnosora		5	8	12			Japan	97/36
280	Dryopteris	hangchoensis		5	8				Japan	92/43
281	Dryopteris	hondoensis		10	3	24	EKTN		Jap	97/197 92/9
282	Dryopteris	indusiata ?		4	8	72			JP Taw	93/45
283	Dryopteris	intermedia		10	3	34	ZSNOEK		E N America	97/83 95/8
284	Dryopteris	Khasiana		6	8					95/2
285	Dryopteris	Kunthii		8	7		2K			97
286	Dryopteris	lacera		50	5	24	NTKE		EasiaIndia	97/7 96/157.173
287	Dryopteris	Lepidoda		5	5	20	ZNEK		NindiaCh Eur	97/36 94/45
288	Dryopteris	Ludoviciana		15	6	46	ASEWK		SE US	97/181 96/156
289	Dryopteris	Ludoviciana	x Hybrid	5	6	46	ASEWK		SE US	97/156 95/9 94/2
290	Dryopteris	marginalis		50	2	25	ESNOK		NE N. Am	97/182.83.198.1
291	Dryopteris	monticola		5	7					96/45
292	Dryopteris	Nameqatae		1	7		3		Jap	94/45
293	Dryopteris	nigropaleacea		2	7				Him.Nindia	93/9
294	Dryopteris	oreades		20	4	20	NSVKE		Eur	95/12 94/45.104
295	Dryopteris	pallida		5	8				SEur	93/12
296	Dryopteris	pallida	pallida	25	8				SEur	95/135 92/26
297	Dryopteris	pallida	raddeana	8	8				Russia	94/45
298	Dryopteris	polylepis		9	6	24	EKNT		Jap	97/36 96/18
299	Dryopteris	pseudo-mas		6	4	24	INSOK		Eur	95/2 94/148
300	Dryopteris	pseudo-mas	Cristata	1	4	24	INSOK		Eur	93/38
301	Dryopteris	purpurella		4	5	36	INSKE		Japan	96/173 94/97
302	Dryopteris	pycnopteroides		10	6	24	KENTO		SikkimJap	97/36.156 96/45
303	Dryopteris	Ramosa x Stewartii		4	6				Pakisatn	97/7 96/45
304	Dryopteris	Remota		25	4	36	1KNTE		Eur	97/181.156
305	Dryopteris	Sarcastora		5	7	18	20		Ala?	97/156
306	Dryopteris	sichotensis		15	5	48	EKN		Easia	96/146
307	Dryopteris	sieboldii		8	6	24	ZSENKO		Easia	97/156
308	Dryopteris	sieboldii	Cyenata	5	6	20	ZSNKE		Easia	92/111
309	Dryopteris	sieboldii	Incisum	6	6	24	ZSNKO		Easia	96/10
310	Dryopteris	Sordipes		5	7		2			97/191
311	Dryopteris	sp.	Japan	4	8				Japan	93/7
312	Dryopteris	spinulosa		15	3	24	ZN		N.A.Jp	97/182.108
313	Dryopteris	spinulosa	plumosum	15	3	24	ZN		N.A.Jp	97/182
314	Dryopteris	stewartii		40	7	48	K			96/45.153 95/12
315	Dryopteris	sublacera		20	7	20				95/36 94/24.25
316	Dryopteris	submontana		15	6	20	EANK		Eur. N. Af	96/45 94/104
317	Dryopteris	uniformis		20	5	30	ZNKOE		Easia	97/191 96/157
318	Dryopteris	vana	setosa	10	6	24	ZSNK		Sasia.Philipin	97/7 92/111
319	Dryopteris	villarii		20	5				Eur	96/45.185 95/12
320	Dryopteris	Villarii	Submontana	4	5				Eur	95/61
321	Dryopteris	wallichiana		12	5	40	SNKB		Pantropic	97/173 96/158
322	Dryopteris	X complexa	complexa	4	4	36	ETNK		Europe	97/156 96/45
323	Dryopteris	X complexa	concorda	12	3	36	2ETVNK		Europe	97/7 94/45
324	Dryopteris	X complexa	critica	12	3	36	ETVNK		Europe	94/45
325	Dryopteris	x tavellii		43	5		S		Eur	95/12 92/9
326	Equisetum \$	palustre		7	2	18	1WU		cosmo	95/9
327	Equisetum \$	Ramosissimum		10	7	60	1WUK		Eur. SE US	95/9
328	Equisetum \$\$\$	Scirpoides		10	3	10	KWOG		NHem	95/153
329	Equisetum \$\$\$	Sp.	Micro???	10	4	10	FWOG		Mich???	95/153
330	Equisetum \$	telmateia		10	7	70	QGWUV		NHem	95/9.162
331	Grammitis \$\$\$	billardieri		10	7	5	WTYJ		Pantrop	95/53
332	Gymnocarpium	dryopteris		70	2	12	ERSGV		NHem	97/1 96/164
333	Gymnocarpium	dryopteris	Plumosum	10	2	12	RSgv		NHem	95/108.1.12
334	Gymnocarpium	lovamense		4	8	12	GENTK		EAsia	
335	Gymnocarpium	robertianum		40	2	16	1ASEGN		NHem	97/173 95/9
336	Gymnocarpium	x intermedium		3	7	12	2ERSGV		N.NAm	97/7
337	Hemionitis	Arifolia		2	8	6	KUA		S&SEasiaEindies	97/173 96/156
338	Hypolepis	Distans		5	8		2G		AusNZ	97/57
339	Hypolepis	muelleni		4	8	80	GWUK		AusTasm	93/53
340	Hypolepis	punctata		3	8	48	GUNEK		Asia.Aus.NZCh	
341	Hypolepis	Repens		9	7	80	GS		FlaC&SAmWindle	96/156
342	Isoetes \$\$\$	Melanopoda		10	7	8	1UQFW		SCen Nam	96/184
343	Lastreopsis	lacuminata		8	8	30	ENSJ	Aus	NZ.AusTasm	97/106 95/53
344	Lunathyrium	japonicum		5	6	22	EANTK		S&SE&E asia	94/45 93/36
345	Lunathyrium	Unifurcatum		12	8	24	KO		Jap	95/88
346	Lycopodium	Annotinum		5	3	3	QLTZNO		NHem	95/9
347	Lycopodium \$\$\$	Obscurum		10	3	10	OZSWH		neNAm	95/153
348	Lycopodium \$\$\$	Selago		10	3	6	OZUWH		EindiesNAmNZEur	95/153
349	Lycopodium	japonicum		20	7	72	CNUK		S&SEasia.Aus	96/180
350	Marsilea \$\$\$	Quadrifolia		10	4	4	FEGU		NHem	95/153
351	Matteuccia	orientalis		6	5	30	EZN		far east	97/192
352	Matteuccia \$	struthiopteris		60	2	60	ZWSEVK		N. Hem	96/175
353	Matteuccia \$	struthiopteris	asian form	3	3	60	ZWSEVK		Asia	
354	Matteuccia \$\$\$	struthiopteris	Pennsylvanica	10	2	60	ZWSEO		E. US	95/8 94/120
355	Nephrolepis	cordifolia		8	8	24	URJDE		Pantropic	95/9.151
356	Nephrolepis	cordifolia x Hyb	Paul Cambell	5	8	24	URJDE		Pantropic	95/157
357	Nephrolepis	Obliterata	Kimberly Queens	10	7	36			Aus	94/94
358	Notholaena	sinuata	sinuata	12	7	24	QUDA		SwUs.C&S am	92/104
359	Oleandra	species		10	8				China	95/11
360	Oleandra	species		10	8				KwangtungChina	95/63

HFF	GENUS	SPECIES	CVR	PK	Z	SIZE	GRO	COLL.SITE	ORIG	DONOR
361	Onoclea \$\$\$	sensibilis		60	2	24	WUGZE		NHemAsia	96/161,175 95/9
362	Oreopteris	limbosperma		8	4	40	ZSNK		Eur N.A.	96/185 94/45
363	Osmunda \$\$\$	cinnamomea		10	3	60	WZVEK		NAmEasia	97/144,176
364	Osmunda \$\$\$	claytoniana		5	2	60	ZWSVKE		NAm	97/176
365	Osmunda \$\$\$	Japonica		20	3	32	EYZWS		E&SAsia,Philipp	97/176 95/110
366	Osmunda \$\$\$	regalis		20	3	90	ZWSOK		Cosmo	96/175
367	Osmunda \$\$\$	regalis	Brasiliense	10	3	72	2ZWSVK		SAM	97/194
368	Osmunda \$\$\$	regalis	Crispa	10	3	72	ZWSVK		Cosmo	95/25 94/25
369	Osmunda \$\$\$	regalis	Cristata	10	3	72	ZWSVK		Cosmo	94/25 92/20,113
370	Osmunda \$\$\$	regalis	gracilis	1	4	48	ZWSVK		N. Hem	94/5
371	Osmunda \$\$\$	regalis	Japonica(Dimorphic)	1	4	48	ZWSVK		Easia	94/5
372	Osmunda \$\$\$	regalis	purpurescens	10	3	72	ZWSVK		NAm	96/176
373	Osmunda \$\$\$	Regalis	regalis	10	3	90	ZWSVK		Cosmo	94/25
374	Osmunda \$\$\$	regalis	regalis Purpurascens	10	3	90	ZWSVK		Cosmo	95/110 94/25
375	Osmunda \$\$\$	regalis	spectabilis	10	3	90	ZWSVK		Cosmo	95/25 93/9,150
376	Osmunda \$\$\$	regalis	Undulatum	1	4	48	ZWSVK		N. Hem	94/5
377	Paesia	scaberula		8	8	30	GTEZVN		NZ	97/162
378	Pecuma	alfredii		6	8					96/11
379	Pellaea	andromedifolia		15	8	20	ZUDK		Calif	96/110
380	Pellaea	atropurpurea		5	3	16	UADEK		C&N.A.	96/1,8,173
381	Pellaea	calomelanos		8	8	10	UDAK		AfrEur	94/104
382	Pellaea	Intramarginalis		10	8	30			MexCAM	95/106,165
383	Pellaea	nitidula		10	8	10			ChHawaii	94/104
384	Pellaea	rotundifolia		13	7	6	DTZK		NZ	96/1,45,158
385	Pentagramma	triangulans		10	6	10	UDRK		W.N.Am	95/146,170
386	Phanerophlebia	falcata		1	7				Easia	
387	Phanerophlebia	fortunei		3	7				Easia	
388	Phegopteris	connectilis		40	5	16	SNGVK		N.Hem	97/7,198
389	Phegopteris	decursive-pinnata		6	4	24	2ENT		EurS&Easia	96/181,153
390	Phyllitis	hemionitis		1	8	10			SEur,Canryls	92/45
391	Phyllitis	hybrida		8	5				Eur	96/185
392	Phyllitis	scolopendrium		10	4	24	ARNSKO		N.Hem	97/7
393	Phyllitis	scolopendrium	Angustifolia	6	4	24	ARNSKO		N.Hem	95/2,150 94/9
394	Phyllitis	scolopendrium	Digitatum	1	4	24	ARNSKO		N.Hem	95/2
395	Phyllitis	scolopendrium	marginata	1	4	24	ARNSOK		N.Hem	94/9
396	Phyllitis	scolopendrium	Muricatum	1	4	24	ARNSKO		N.Hem	95/2
397	Phyllitis	scolopendrium	Rhodesian crested	3	4	24	ARNSKO		N.Hem	95/157
398	Phyllitis	scolopendrium	scolopendrium	8	4	24	ARNSKO		N.Hem	95/9 94/154
399	Phyllitis	scolopendrium	Supramarginata	8	4	20	ARENKO		N.Hem	94/9
400	Phymatodes	diversifolium		15	8	20	JGH		SAMAusNZ	97/99 95/9
401	Plagiochya	Japonica		2	8	8	2		Jap	96/157
402	Platynerium	bifurcatum		15	8	24	JHTE		AusEIndiesIndia	95/9
403	Platynerium	bifurcatum x willinckii		15	8	24	1JHTE		QueenAus	97/196
404	Polypodium	amorphum		20	6	12	1R		Pacific NW	94/97
405	Polypodium	Appalachianum	diploid	10	5		2K	Ohio	Ne US	97/83
406	Polypodium	Australe	Cristatum old form	4	6	18			Eur	92/41
407	Polypodium	australe	Dentatum	5	6	18	JNT		Eur	92/41
408	Polypodium	australe	Grandiceps Forster	1	6	18	3JNT		Eur	92/41
409	Polypodium	australe	omnilacerum oxford	2	6	18	JNT		England	92/41
410	Polypodium	australe	SemilacerumFalcatum	6	6	18	JNT		Eur	92/41
411	Polypodium	australeSemilacerum	falcatum O'Kelly	8	6	18	JNT		England	92/41
412	Polypodium	australeSemilacerum	robustum	5	6	18	JNT		England	92/41
413	Polypodium	californicum		1	8	24	3RNT		California	94/1
414	Polypodium	cambricum	cambricum	6	6	10	TNK		swCalif,Eur	95/9
415	Polypodium	cambricum	serrulatum	1	3	8	TN		sw Calif,Eur	95/9 94/154
416	Polypodium	formosanum		10	8	12	HSJNT		TaiwCh Japan,	97/106,196 96/1
417	Polypodium	glycyrrhiza		8	5	20	JSRHN		NW N.Am	97/7 96/10,1
418	Polypodium	interjectum		22	6	20	UWRAK		Eur	95/9 94/135,154
419	Polypodium	interjectum	Glomertum Mullins	2	6	20	UWRAK		Eur	92/41
420	Polypodium	scouleri		10	7	14	TNJR		W.N.Am	97/7 96/1
421	Polypodium	vulgare		10	5	12	NTJK		N.Hem	95/9,166 93/38
422	Polypodium	vulgare	Bifido-cristatum	3	4	12	NTJK		Cosmo	97/7 94/45
423	Polypodium	vulgare	Cornubiense	2	5	14	NTJK		N.Hem	97/7
424	Polypodium	vulgare	prionodes	1	4	14	NTJK		Cosmo	94/9
425	Polystichopsis	mutica		3	8				Jap	94/45
426	Polystichum	acrostichoides		40	3	28	SNOK		N.Am	97/83,108
427	Polystichum	Acrostichoides	Forked pinnae	10	3	28	SNOK		N.Am	97/108
428	Polystichum	aculeatum		30	4	30	EASRGN		Eur, N India	97/188,36
429	Polystichum	aculeatum	Acutilobum	10	4	30	1EASRG		Eur, N India	95/150
430	Polystichum	aculeatum	Nrw,split form	2	4	24	ASRNGE		Eur, N India	
431	Polystichum	andersonii		40	6	36	1WSRK		NW N.Am	97/173 96/10
432	Polystichum	australiense		10	8				Aus	95/106
433	Polystichum	braunii		60	3	28	SNOKE		N.Hem	97/188,173,108
434	Polystichum	californicum		12	7	30	RNT		California	97/170,4 94/1
435	Polystichum	falcinellum		20	7	24			S.EurMadg,Madiera	96/45 93/12
436	Polystichum	limbicans		30	3	24	SNK		W.N.Am	94/97 93/7
437	Polystichum	lemmonii		6	6	12	TNLK		W.N.Am	93/28,132
438	Polystichum	lobatum		3	6	12			Ch	93/9 93/12
439	Polystichum	lonchitis		30	3	18	ASWOK		N.Hem	96/45 95/8
440	Polystichum	makinoi		20	5	24	EKNOT		CH, Jap	97/7 96/45,173
441	Polystichum	mayerbarae		3	6	18	TNK		ChJap	96/150 94/36
442	Polystichum	mohnodes		30	5	14	R		SAM,W.N.Am	93/12 92/12
443	Polystichum	munitum		60	5	58	SNOK	Ont.	W.N.Am	97/199,1 94/12
444	Polystichum	munitum	Crispate	10	5	58	SNOK		W.N.Am	
445	Polystichum	munitum	Twisted Pinna	4	5	36	SNKO		W.N.Am	94/25
446	Polystichum	neolobatum		28	5	24	ENOKS		JpChNep Him	97/188,7
447	Polystichum	polyblepharum		25	5	24	SZEK		JpChKor	97/7,156 96/158
448	Polystichum	proliferum		8	5	36	NTEK		AusNZ	97/188 94/97
449	Polystichum	retroso-paleaceum		10	5	36	SNEKO		JpChKor	97/36 94/45,38
450	Polystichum	Richardii		2	6	24	KN		NZ	95/9

HFF	GENUS	SPECIES	CVR	PK	Z	SIZE	GRO	COLL.SITE	ORIG	DONOR
451	Polystichum	rigens		1	3	24	KNT		JpChKor	93/9.26
452	Polystichum	setiferum		99	5	40	TNKE		Europe	97/7.197.181
453	Polystichum	Setiferum	Acutilobum	5	5	40	TNK		Europe	92/45
454	Polystichum	setiferum	Congestum	15	5	40	TNK		Europe	96/158.95/2
455	Polystichum	setiferum	Conspiculobum	3	6	40	TN		Europe	94/45
456	Polystichum	setiferum	Conspicupinnulum	4	6	40	TN		Europe	94/45
457	Polystichum	setiferum	dahlem	8	5	40	TN		Eur	96/158
458	Polystichum	setiferum	divisilobum angustatum	3	6	40	TN		Europe	94/45
459	Polystichum	setiferum	divisilobum cristatum	2	6	40	TN		Europe	94/97
460	Polystichum	setiferum	Herrenhausen	6	5	40	TNK		Europe	95/2
461	Polystichum	setiferum	Mrs Hughes	3	6	40	TN		Europe	94/45
462	Polystichum	setiferum	Perserratum	2	5	40	TNK		Europe	92/101
463	Polystichum	setiferum	proliferum	5	5	40	TN		Eur	95/2.94/9
464	Polystichum	setiferum	proliferumWollastonii	6	6	40	NT		Eur	97/173
465	Polystichum	setiferum	Rotundatum	5	6	40	TN		Europe	95/141.94/45
466	Polystichum	setiferum	RotundCristatum	8	5	40	TNK		Europe	96/10.94/20
467	Polystichum	setigerum		20	2	48	1SNK		NW NAm	94/12.92/7.9.26
468	Polystichum	silvaticum		8	8	18			TasmaniaNZ	
469	Polystichum	squarrosum		10	7	18	NTK		EurIndiaHimalaya	94/36.93/97
470	Polystichum	Transkeiense		1	7		ZNKSGE		STropics	96/164
471	Polystichum	tripteron		25	5	24	NTE		Easia	96/45.173.95/12
472	Polystichum	tsus-simense		15	6	18	ZSNKE		Ch Jp Kor	97/7.197.156
473	Polystichum	woronowii		4	7				SWAsia	
474	Polystichum	x bicknellii		4	6		12		Eur	96/45
475	Polystichum	x illyricum		40	5				SEur	96/45.94/97.93/9
476	Polystichum	x wirtgenii		4	6		12		Eur	96/45
477	Polystichum	Xiphophyllum		9	7	20			Chin. Taiwan	96/21
478	Pteridium	laquilinum	laquilinum	20	3	120	GUDOKE	Eng	Euope	97/91
479	Pteris	cretica		30	8	24	THNEK		Comso	96/156.95/9
480	Pteris	cretica	Albo lineata	25	8	24	THNEK		Comso	97/173.96/158
481	Pteris	cretica	AlboLineataAlexandrae	10	8	24	THNEK		Comso	95/160
482	Pteris	cretica	cretica	1	8	24	THNEK		Comso	95/9
483	Pteris	cretica	Major	4	8	24	THNEK		E Hem	95/157
484	Pteris	cretica	Mayii	3	8	24	THNEK		E Hem	95/157
485	Pteris	cretica	Parkeri	4	8	24	THNEK		Comso	97/11
486	Pteris	cretica	Rivertoniana	10	8	24	THNEK		Comso	95/11.94/110
487	Pteris	cretica	Rowenii	2	8	24	THNEK		E Hem	95/2
488	Pteris	cretica	wilsonii	1	8	24	THNEK		Comso	95/9
489	Pteris	cretica	Wimsettii	9	8	24	THNEK		Comso	95/9.2.157
490	Pteris	Incompleta		2	8				SWEurNafr	95/9.94/24
491	Pteris	macilentata		15	8	30	WSNEK		NZ	97/191.95/53.37
492	Pteris	multifida		3	6	20	NTREA		JapChPhilip	96/156.95/9
493	Pteris	semipinnata		2	8	30	KTN		E asia	95/110
494	Pteris	tremula		26	8	60	ETHNK		AusNZ FIJI	97/57
495	Pteris	vittata		30	8	36	UANEK		E Hem	95/160.9.94/110
496	Pyrrosia	polydactyla		10	8	7	UNE		Taiwan	96/1.95/63
497	Rumohra	adiantiformis		10	8	48	SNJ		SHem	95/108.157
498	Salvinia \$\$\$	Natans		10	8	1	EFWHG		Eurasia	95/2
499	Selaginella \$\$\$	Uncinata		10	6	2	GOSZ		China	95/153
500	Thelypteris	Acuminatus		5	8				Jap	94/82
501	Thelypteris	decursive-pinnata		6	4	24	ENT		EurS&Easia	97/156
502	Thelypteris	Dentata		1	6	30	1AHTKN		Pantrop	95/156.94/156
503	Thelypteris	hexagonoptera		20	4	20	ISZNEOK		E NAm	97/173.96/181
504	Thelypteris	japonica		2	8	14	NTK		Easia	
505	Thelypteris	kunthii		10	7	36	GNRET		SE US	97/181.95/27.9
506	Thelypteris	novaeboracensis		28	4	18	ZTNEGO		NAm	95/156.108
507	Thelypters	palustris		18	2	30	WZSKG		Eur.N Am	96/185
508	Thelypteris	palustris	palustris	15	4	18	WZGSK		Eur.N Am	92/24
509	Thelypteris	palustris	pubescens	6	4	30	WZGSK		Eur.N Am	92/9
510	Thelypteris	phegopteris		25	2	24	SNZOK		Eur.N Am	97/108.96/129.8
511	Thelypteris	simulata		2	4	24	WZT		NE NAm	95/141.93/9
512	Thelypteris	torresiana		20	8	40	AWETK		Cosmo	97/181.95/156
513	Tmesipteris \$\$\$	Ovata		10	8	16	GQLK		Aus	95/53
514	Todea \$\$\$	barbara		10	8	48	QUNK		AusNZ.S Af	95/53
515	Tnchomanes \$\$\$	Sp	NZ	10	5	12	2KWHG		NZ	97/12
516	Unk.	Mutant 1		2	4	18	K		NY	97/157
517	Unk.	Mutant 2		2	4	18	K		NY	97/157
518	Unkown		Montrose Bot Gard	10	5	16	KNT		Montrose	96/18
519	Woodsia	fragilis		30	5	14	TK		Wasia	97/7.96/45
520	Woodsia	intermedia		8	5	6			EAsia	96/45.94/9
521	Woodsia	obtusa		10	3	14	RTNEA		NAm	97/52.96/174
522	Woodsia	polystichoides	Wooly type	8	4	10	2RUZEN		EAsia	97/7.96/45.173
523	Woodwardia	fimbriata		3	7	80	TWUEK		CalifMex	93/7.25.97.92/4
524	Woodwardia	radicans		10	7	60	NUEK		Eurasia	94/9.135.93/114
525	Woodwardia	Unigeminata		3	8	40	2EZKG		Easia	97/4
526	Woodwardia	virginica		20	3	24	WZUGO		E NAm	96/180.181.153



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